

SCIENTIFIC NOTE

A new record of *Culex restuans* Theobald (Diptera: Culicidae) in British ColumbiaSEAN MCCANN¹ and PETER BELTON¹

Culex restuans is a New World mosquito species closely related to and resembling the cosmopolitan house mosquito *Culex pipiens* L. Typically, *Cx. restuans* lays its egg rafts on the surface of woodland pools, but it has adapted to lay its eggs in artificial containers. Immature stages can be found in water-filled containers from abandoned appliances to used tires that harbour algae. The immature stages of *Cx. restuans* can develop in water that ranges from clear to highly polluted. Like *Cx. pipiens*, the females obtain blood meals from birds, but can also feed on a broad range of mammal and reptile hosts (Hayes 1961). For that reason, the females have been identified every year since 2002 as a carrier and potential vector of West Nile virus (Ebel et al. 2005).

Its life cycle is similar to our other *Culex* species. Those adults that eclose in the late summer and fall mate, but the females are in reproductive diapause and feed only on carbohydrates before overwintering. In rural habitats, they probably search out underground burrows and similar sites to hibernate, but in anthropic habitats, they are common in basements and outbuildings.

Its known distribution in America ranges from the eastern half of Alberta south and east to Guatemala, and it is common in southeastern Canada and the eastern and central United States. There are fewer records in the west, although according to Darsie and Ward's (2005) authoritative work, the insect's range extends to the west coast through Wyoming, southern Idaho and Oregon. Well-substantiated records in southwestern California exist.

We describe the first verifiable record of this species in British Columbia (B.C.) from a photograph taken by one of us (McCann) in Goldstream Provincial Park, on Vancouver Island, about 16 km northwest of Victoria, on 10 October 2010 (Fig.1). The *Cx. restuans*

female was found under a bridge deck alongside *Cx. tarsalis* and *Culiseta incidens* females. Its pale abdomen was distended with hypertrophied fat body and it was probably ready to hibernate but unfortunately escaped capture. The paired patches of pale scales on the scutum, which were clearly visible, allow reliable differentiation of this individual from *Cx. pipiens*. The scutum of *Cx. pipiens* has never been reported with the pale spots or the pale scales that are clearly visible above the wings on the scutum of the female we photographed, confirming our identification.

Three other records of this species in or close to B.C. have been explained as misidentifications or accidental introductions. The provincial record is of a female taken in a light-trap at Esquimalt (Twinn 1945). The specimen is lost, and Wood et al. (1979) considered it to be a misidentified *Cx. pipiens*. Further east, there are records of *Cx. restuans* near the northern border of the Idaho panhandle, just south of Creston, B.C. (State of Idaho 1985). There seem to be no specimens confirming these records. Darsie and Ward include their localities on the distribution map of the first edition of their monograph (Darsie and Ward 1981), but not in the second (Darsie and Ward 2005, Plate 29B). The third record is from Island County, in northwestern Washington, close to Seattle and Tacoma. Sames et al. (2007) point out that this record is "far outside the distribution range"—depicted in Darsie and Ward (2005)—and suggest that "this species may have been accidentally introduced into Island County" by tourists or from nearby ports.

We believe our specimen lends credence to Twinn's 1945 identification, because Esquimalt is within flying range (9 km) of Goldstream Provincial Park, and both are just across the Salish Sea (63 km) from Island County, WA. We suspect that these western records are from established populations that

¹Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia, Canada.



Figure 1. *Culex restuans* female; photograph by S. McCann. Note two patches of pale scales on scutum (inset, arrows) that identify this as *Culex restuans*, and the distended abdomen typical of overwintering *Culex* females.

have simply not been noticed. The recent interest in West Nile virus vectors has focused on identifying females, but many of those captured in light traps have the scales on their scuta denuded. Even unrubbed specimens may not show the pale scale patches. Fortunately,

the males and larvae of *Cx. restuans* are quite distinct from those of *Cx. pipiens*, and we continue to search for them and urge collectors to look closely at specimens taken near these locations and elsewhere in B.C. and its neighbouring states.

REFERENCES

- Darsie R. F., and R. A. Ward. 1981. Identification and geographical distribution of the mosquitoes of North America, north of Mexico. Mosquito Systematics Supplement 1: 1–313
- Darsie R. F., and R. A. Ward. 2005. Identification and geographical distribution of the mosquitoes of North America, north of Mexico. University Press Florida, Gainesville FL, pp 384
- Ebel, G. D., I. Rochlin, J. Longacker and L.D. Kramer. 2005. *Culex restuans* (Diptera: Culicidae) relative abundance and vector competence for West Nile virus. Journal of Medical Entomology, 42(5), 838–843.
- Hayes, R. O. 1961. Host preferences of *Culiseta melanura* and allied mosquitoes. Mosquito News 21: 179–187.
- Sames W. J., A. Duffy, F. A. Maloney, J. S. Townzen, J. M. Brauner. C. P. McHugh and J. Lilja. 2007. Distribution of mosquitoes in Washington State. Journal of the American Mosquito Control Association 23(4): 442–448
- State of Idaho Dept. of Health and Welfare 1985. Mosquitoes of Idaho, pp 23
- Twinn, C. R. 1945. Report of a survey of anopheline mosquitoes in Canada in 1944. Proceedings of the New Jersey Mosquito Extermination Association 32: 242–251
- Wood, D. M., P. T. Dang and R. A. Ellis. 1979. The Insects and Arachnids of Canada 6. The Mosquitoes of Canada (Diptera: Culicidae). Agriculture Canada, Ottawa, ON. pp. 279.